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PAPERS  
IN  
AGRICULTURE.

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*The GOLD MEDAL of the Society, being the Premium offered for Planting Larches, was this Session adjudged to JOHN CHRISTIAN CURWEN, Esq. M. P. of Workington Hall, Cumberland, from whom the following Communications were received.*

DEAR SIR,

I PRESUME once more to offer myself a Candidate for the Society's Premium for Planting.

The complete success of my former plantations on the banks of Windermere, determined me to appropriate to a similar purpose, a tract of four hundred acres of mountain land, in the same neighbourhood.

From experience I feel myself justified in stating, that no speculation holds out a more flattering prospect, than making plantations on many indifferent mountain pasture lands. The plot I now claim for, though surrounded with a wall six feet high, would not have let as a sheep pasture, for two shillings and six-pence per acre. I feel confident, that I

C

greatly

greatly underrate the value of the wood at sixty years growth, when I estimate it at fifteen shillings per acre, with compound interest, or two hundred and sixty two pounds per acre. At this moment I believe an acre of Scotch fir, the least valuable of forest wood, to be at sixty years growth wherever there is a market, three hundred pounds per acre; and I do not take into the account the produce of thinnings, which after thirty years must be of considerable value. I think larch might be estimated as worth one pound per acre, with compound interest, or three hundred and fifty pounds. I have given a decided preference to larch trees, as out of one million two hundred and sixty-nine thousand trees in the present statement, above one half are larch, as I conceive larch trees to be best suited for high and exposed situations.

In every instance, each species of trees is planted separately; I believe this will be found advantageous in all situations, but admits of no doubt when wood is exposed. I have reduced my number to three thousand per acre, as the thinnings in such situations will not pay the labour. The fears I entertained for the larch from the distemper with which a few years ago they were attacked, in various parts of Scotland and Northumberland, have subsided. I observed a plantation this season in Northumberland, which had been a great sufferer, but was now beginning to make fresh wood. As an encouragement for planting larches, I beg leave to state that I have trees at Windermere of twenty four years growth, which contain twenty-five feet of timber; this is however to be understood of favoured spots, but in all dry situations, the larch gives the most flattering prospect of making ample returns of profit.

Inclosed are Certificates from the nurserymen who furnished, and the person whose duty it was to count and examine,

amine, the trees, likewise others from the Rectors of Hawkshead and Workington.

This is the greatest exertion I have made in planting, and I must in candour and fairness attribute it to Mr. Johnes of Hafod's declaration to the Society of his intention to plant an annual million ; this stimulated me to attempt it, and I have fortunately succeeded. Though I hope to continue to the latest period of my life a planter, I do not conceive it likely that I shall ever be in a situation to make so extensive a claim again for the honours of the Society. I beg leave to make my acknowledgements to them, for the favors they have already bestowed upon me. The pleasure and satisfaction they have afforded me, have abundantly repaid my exertions ; the benefit will be to the public, and those who succeed me ; the merit of having promoted the object, will ever remain due to the Society, whose honorable rewards will I trust to the latest period, be held in the same estimation by others, as they are by,

Dear Sir,

Your obedient humble Servant,

J. C. CURWEN.

*Workington Hall, Dec. 24, 1808.*

To C. TAYLOR, M. D. SEC.

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Certificates were received from JOHN SAUNDERS, and CALEB ATKINSON, nurserymen, stating, that having contracted with J. C. Curwen, Esq. to plant for him with forest trees, upwards of four hundred acres of land, on Clar common, his property, after the rate of three thousand trees per acre, they had actually planted for him there, between the first of October 1805, and the last day of April 1806, above

one million two hundred and eight thousand trees of the following kinds; viz. upwards of 530,000 larches, 200,000 Scotch firs, 336,000 ashes, 70,000 oaks, 30,000 elms, 24,000 beeches, and 18,000 alders.

These certificates were further confirmed by ROBERT RAYEN, Agent to J. C. Curwen, Esq. who counted the trees planted by Messrs. SAUNDERS and ATKINSON.

Certificates were also received from ROBERT PORTER, WILLIAM TURNBULL, and JOHN GREENER, testifying to further plantations made by J. C. Curwen, Esq. within the above period, containing 19,000 oaks, 70,300 larches, 2,100 birch, 4,000 beech, 100 poplars, and 600 Scotch firs.

A Certificate from the Rev. REGD. BRATHWAITE, minister of Hawkshead, dated July 27, 1808, stated that he had on that day viewed the Heald plantation, the property of J. C. Curwen, Esq. consisting of four hundred acres of land or upwards; that it is surrounded with a stone wall, which is in general six feet high, and the trees completely secured from depredation; that the wood is in general very thriving, particularly so where the heath hath been burnt previous to planting. That he also saw the flourishing condition of all the plantations which surrounded the Heald; and that he has no doubt of its being in a very few years, a most thriving and valuable plot of wood.

A Certificate from the Rev. PETER HOW, Rector of Workington, dated Feb. 4, 1809, stated, that he had viewed the plantations of J. C. Curwen, Esq. at Workington, and found those parts which had been replanted with young trees, in a flourishing condition, and the whole well fenced. That the general thriving state of these plantations, considering their elevated situation and exposure to the sea, has greatly surpassed the most sanguine expectation.

*The*

*The GOLD MEDAL of the Society was this Session voted to W. M. THACKERAY, M. D. of Chester, for extensive Plantations made by him of Ash, Chesnut, Elm, and other Forest Trees. The following Communications were received from him.*

SIR,

SEVERAL persons interested in the cause of planting and agricultural improvements, having thought that I ought to transmit to the Society of Arts, &c. an account of the plantations I have made in the counties of Denbigh and Merioneth, from Nov. 1804, to May 1808, on the estates of my ward and stepson (now a minor), John Maurice Jones, Esq. I have been induced to draw out a plain statement of them, which I request you will please to lay before the Society.

Not having particularly attended to their rules and regulations, I know not whether I shall be entitled to any honorary reward for my exertions, I submit them however to their consideration, and beg leave to add, that it is my intention to inclose and plant for the next four years during my stepson's minority, thirty acres annually of land which is at present unproductive, being fully convinced that I cannot in any other way prove myself so useful or faithful a guardian to him as by so doing, and I hope that the benefit accruing from such conduct will eventually prove advantageous to the country at large.

In the statement for the different years, I have confined my return to the number of trees in the regular plantations, though I have also filled the hedge-rows of the estate with many thousand trees, and have dibbled at the time of planting through the different plantations more than thirty bushels of

acorns, which grow uncommonly well. I need scarcely to add, that I have taken every care to preserve them from the trespasses of sheep, cattle, and idlers, by the best kind of defence, viz. walls six feet high, or quickset fences. The whole of the plantations are more than one hundred and seventy acres, and the land mountainous, declivities of hills, or dingles incapable of being improved by the plough. Part of the land is of a thin moory or boggy nature upon Ramel, and part nut-brown soil of a middling depth. In other places the soil is brown, thin, and intermixed with rocks. Every tree injured or destroyed has been carefully replaced.

My nurseries at Dolfriog, Bwlchy Park, and in Chester, contain many thousand forest trees of various kinds, from one to four years old, including near four thousand American oaks.

Since I have begun my agricultural pursuits, I have expended upwards of three thousand pounds, in draining, irrigating, and otherwise improving the before-mentioned estates, which improvements I purpose on some future occasion to lay before the Society.

I have the honour to be, Sir,

Your obedient humble servant,

W. M. THACKERAY, M. D.

*Chester. Sept. 25, 1808.*

To C. TAYLOR, M. D. SEC.

Account

Account of the number of Acres inclosed and planted, and of the quantity and kind of Trees planted, by W. M. Thackeray, M. D. Guardian to John Maurice Jones, Esq. a Minor, in the Counties of Denbigh and Merioneth.

From November 1804, to May 1805.

<i>Denbighshire.</i>			Ash	-	-	6,634
			Do. Mountain	-	-	50
On the lands of Bwlchy Park	A. R. P.	1 1 12	Beech	-	-	18,400
Of Gallygunnan	-	21 0 38	Birch	-	-	50
			Spanish Chesnut	-	-	260
			Horse Chesnut	-	-	1,260
<i>Merionethshire.</i>			Elm	-	-	3,600
			Fruit	-	-	60
Of Cwm Caith	-	10 0 28	Larch	-	-	59,220
Of Cyfty	-	7 3 3	Oak	-	-	62,600
Of Dolffriog	-	6 2 6	Poplar	-	-	3,300
			Quicksets	-	-	27,100
			Scotch fir	-	-	4,100
			Sycamore	-	-	7,226
			Willow	-	-	1,800
			Within	-	-	200
						195,897

From November 1805, to May 1806.

<i>Denbighshire.</i>			Ash	-	-	8,500
			Beech	-	-	29,700
On the lands of Bwlchy Park	A. R. P.	0 2 29	Horse Chesnut	-	-	1,500
Of Brinelle	-	9 0 2	Elm	-	-	1,000
			Gilead fir	-	-	240
<i>Merionethshire.</i>			Larch	-	-	33,000
			Oak	-	-	32,000
On the lands of Cwm Caith			* Black Italian Poplar	-	-	21,700
and Dolffriog	-	9 0 0	White Poplar	-	-	9,800
			Balsam Poplar	-	-	250
			Quicksets	-	-	64,000
			Scotch fir	-	-	17,500
			Spruce fir	-	-	9,500
			Sycamore	-	-	5,250
			Willow	-	-	1,800
						235,740

\* M. B. At Pryddlewell we found in Sept. 1st, 1808, a black Italian poplar, which had been planted in February 1805, when only one inch in girth, a foot from the ground, and six feet high, which now measured twelve inches in girth, and was more than sixteen feet in length.



From November 1806, to May 1807.

<i>Denbighshire.</i>			Ash	-	48,213
			Mountain Ash	-	1,000
On the lands of Craighlelo	A. R. P.	15 1 10	Beech	-	51,983
Of Cuffnant		1 2 16	Birch	-	1,000
			Horse Chesnut	-	1,992
			Spanish Chesnut	-	371
<i>Merionethshire.</i>			Elm	-	1,000
			Fruit	-	54
On the lands of Cwm Caith	40 0 0		Larch	-	119,045
Of Gellyrin	7 0 0		Oak	-	16,356
Of Cyfty	3 2 0		Black Italian Poplar	-	800
Of Penylan	1 2 0		Do. cuttings	-	11,000
Of Cae Glas	0 1 0		Athenian Poplar	-	37
			Quicksets	-	26,000
		69,026	Scotch fir	-	21,380
			Spruce fir	-	2,000
			Sycamore	-	13,338
			Willow	-	4,000
			Golden Willow	-	200
					319,769

From November 1807, to May 1808.

<i>Denbighshire.</i>			Alders	-	120
			Ash	-	75,575
On the lands of Gallygunnen	A. R. P.	56 0 0	Beech	-	36,786
			Horse Chesnut	-	100
			Spanish Chesnut	-	6,300
			Elm	-	2,600
			Do. Grafted	-	200
			Larch	-	171,390
			Oak	-	38,632
			Poplar	-	328
			Black Italian	-	600
			Quicksets	-	21,300
			Scotch fir	-	18,320
			Silver fir	-	258
			Spruce fir	-	3,000
			Sycamore	-	6,596
			Willows	-	362
					382,467

A Certificate

A Certificate from THOMAS JONES, dated Sept. 30, 1808, stated, that by order of Dr. Thackeray he planted and sowed with acorns the lands of Cwm Cath, Dolfriog, and Gellyrin, in the parish of Bethgelert, in the county of Merioneth; and that he believes the land which he planted and sowed with acorns, were more than seventy-two acres; that the land is fairly and properly fenced with a good wall six feet high; and that he supposes a fair proportion of the trees above-mentioned were set in the land when he was employed as planter.

A Certificate from THOMAS ROBERTS, dated Sept. 27, 1808, testified, that by order of Dr. Thackeray he did plant and sow with acorns the lands of Gallygunnan, Bwlchy Park, and Cuffnant, in the parish of Llanarnon, in the county of Denbigh; of Craighlelo, in the parish of Gwddeolaer, and of Cyfty, in the parish of Llanceil, in the county of Merioneth; and that he believes that the lands which he planted and sowed did contain more than ninety-six acres; that the said land is properly fenced with a good wall or quicksets, and posts and rails; and that he supposes a fair proportion of the number of trees above-mentioned were set in the lands where he was employed as planter.

Certificates from THOMAS HUGHES, of Plasnewydd, and W. WILLIAMS, of Garreglwyd, dated Sept. 27, 1808, stated, that they had examined the plantations described by Dr. Thackeray, and believe his statement to be correct; that the whole land is fairly planted and sown with acorns; that the trees are in good health and a thriving state; and that they are secured from trespass and external injury by sufficient fences.

*The GOLD MEDAL of the Society, being the Premium offered for planting Oaks, was this Session adjudged to WILLIAM CONGREVE, Esq. of Aldermaston-House, in Berkshire, from whom the following Communications were received.*

SIR,

I REQUEST you will have the goodness to lay before the Society of Arts, &c. the following account of plantations of acorns made by me. Although not quite half the quantity of land was planted with acorns precisely at the time required in the list of their Premiums, I trust the Society will not, from that circumstance, consider this communication as undeserving of their notice, as I observe that the Society are desirous of encouraging improvements of all kinds, though they are not particularized in their list of premiums offered.

Permit me now to state the following account of my plantations.

No. 1. Upwards of twelve acres of a piece of land called the Arbor Hill, in Aldermaston Park, I planted with acorns in February, 1802. Many of the plants are now from six to eight feet high, and very healthy; they were injured by rabbits when young, or would have been considerably higher.

No. 2. Three acres of adjoining land, I planted in February 1806; the oak plants are now from a foot to eighteen inches high, and very healthy.

No. 3. A part of Upton Common, in the parish of Alston, inclosed by act of parliament in 1805, I planted with acorns  
in

in February 1806 ; this piece of land is about eleven and a half acres, and the plants are now about a foot high.

No. 4. I planted in February 1807, one acre and three quarters of the same common, joining the parish of Sulhamstead. The oak plants are about a foot high.

No. 5. In February 1807, I planted about three acres of an inclosed piece of land called Lady Wood, in the parish of Aldermaston. These plants are about a foot high.

No. 6. In February 1807, I planted about twenty acres of inclosed land on the side of a rising ground called Mareridge Hill, in the parish of Ufton. The plants are now about a foot high.

No. 7. In February 1807, I planted two acres and a quarter of inclosed land in Aldermaston Park, called the Shaw Close. The plants are now about a foot high.

No. 8. In February 1807, I planted several small pieces of land in Aldermaston Park, containing upwards of three acres. The plants are now about a foot high.

No. 9. In February 1808, I planted four and a half acres of an inclosed piece of land called the Furze Ground, adjoining Aldermaston Heath. The plants are now about six inches high.

No. 10. In February 1808, I planted a piece of land containing eleven acres, formerly divided into four small inclosures, in the parish of Aldermaston. The plants are about six inches high.

No. 11. In February 1808, I planted two and a quarter acres of a piece of inclosed land, in the parish of Aldermaston, called Wicken's Piddle. The plants are now about six inches high.

The

The whole of the plants are well fenced, and there are many more than three hundred plants upon every acre of ground. In all the plantations the acorns were set by women and children with sticks used in bean setting, and about two inches deep, in rows a yard asunder, and a foot between each acorn.

Excepting in No. 1, the land was not prepared in any way whatever. Where there was furze and heath, the furze was cut as close as possible, but the heath was left as a shelter to the young plants. I conceive that very young trees of all kinds are more injured by being exposed to a hot sun, than by any other cause whatever, and that heath or long grass is a great protection to them.

In No. 1. the land had been ploughed two or three times, and about a month after the acorns were set, it was sown with furze seed, broadcast, and harrowed. The furze has grown very luxuriant, and has, in some places, been twice cut for bavons for burning bricks; and it has, I think, been of service in affording shelter to the plants when young, but owing to the difficulty of destroying rabbits in strong furze, they have increased so much as to injure the young plants very materially in some parts of the plantation. They are now, however, so high, that they will probably destroy the furze entirely in two or three years. In the other plantations birch has been planted amongst the acorns.

The land is, in general, a mixture of gravel and clay, and in a few places almost entirely clay. About eighteen acres are heath land, totally uncultivated and unproductive; the remainder arable, of a very inferior quality, and some of it so bad and uneven as not to have been thought worth cultivating for some years past by the farmer who rented it. The number of acres planted in February 1807, were thirty.

Forty-

Forty-four acres were planted before and since, making in the whole seventy-four acres planted with acorns.

I have the honour to be, Sir,

Your most obedient humble servant,

WILLIAM CONGREVE.

*Aldermaston-House, Dec. 3, 1808.*

To C. TAYLOR, M. D. SEC.

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Certificates were received from the Rev. G. H. DEANE, Minister of the parish of Aldermaston, and WILLIAM STEPHENS, and WILLIAM HICKMAN, inhabitants of the same parish, dated Dec. 3, 1808, stating that they had inspected the plantations above described, and that the statement concerning them is in every respect accurate.

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SIR,

I was favoured with your letter yesterday, and am sorry that my having neglected to attend to the rules laid down by the Society has occasioned you the trouble of writing again upon the subject of my plantations. I was very much hurried at the time the statement was drawn up, and was not aware, till I received your letter, that I had omitted noticing the present thriving condition of the plants. I have lately had an opportunity of examining the plantations more accurately, and find that in some of them, where the plants were described as being one foot high, they are in fact nearer three feet, and are in general in the most thriving state possible. Mr. Deane, the clergyman of this parish, who signed the former certificate, is at present from home, and not likely to

to return for some time ; but two signatures of the present state of the plants will probably be considered as sufficient.

I have the honour to be, Sir,

Your most obedient servant,

WILLIAM CONGREVE.

March 13, 1809.

TO C. TAYLOR, M. D. SEC.

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Certificates from WILLIAM STEPHENS and WILLIAM HICKMAN, of the parish of Aldermaston, testified, that on the 13th March, 1809, the oak plants in all the plantations belonging to William Congreve, Esq. in the parishes of Aldermaston and Upton, referred to by them on the 3d December, 1808, are now in a healthy and thriving state, and are all well fenced.

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*The SILVER MEDAL of the Society was this Session voted to Mr. WILLIAM LESTER, of Paddington, for a Machine for Washing Potatoes and other esculent Roots for feeding Cattle. The following Communication was received from him, and a Model of the Machine is preserved in the Society's Repository.*

SIR,

**H**EREWITH you will receive a machine for the more expeditious washing of all tuberous rooted vegetables (such as potatoes, turnips, carrots, &c.) from the soil that adheres to them when taken from the ground.

The

The staved cylinder revolving in a trough of water so slow as not to excite the centrifugal force, is not new. I have made use of it myself twelve years ago, but always found it cold and wet work to take the roots from it when washed. To obviate which, I have added the levers and wheels, and find it a very great improvement, as a boy therewith can do the work of two men, without exposing himself to the dangerous effects of dabbling in cold water. The importance of this mode will appear very obvious, when compared with the present laborious one used by the potatoe sellers in London. The partial motion given to the potatoes by stirring them about in a tub, cannot separate the soil so effectually from them, as when the water is more violently agitated by their falling over each other in a revolving cylinder, neither will they be so much bruised as by the ends of the levers. If the soil should be particularly adhesive, the heads of a couple of old hearth or birch brooms put into the cylinder will effectually disengage it from the eyes of the potatoes, and as the dirt separates, it falls to the bottom of the water in the vessel under the cylinder.

If you will have the goodness to lay this before the Society, and it should be deemed worthy of their attention, I will, if necessary, on being requested, attend to explain the effects of the machine.

I am, Sir,

Your most humble

and obedient servant,

W. LESTER.

*Paddington-Green, Nov. 24, 1807.*

TO C. TAYLOR, M. D. S<sup>r</sup> C.

SIR,



SIR,

ON my return from the west of England yesterday morning, I found your letter; I therefore had not time to procure any Certificates from the country by this day's post.

I have sold root washers to the following gentlemen, viz. Lord NORTHAMPTON, at Castle-Ashby, Northamptonshire; Mr. LUDLOW, Cheshunt, Herts; Mr. CLERK, New Park, Hadlow, Kent; and several others, all of which have been approved of.

I have no intention to apply for a patent for it, as it has been at work in different parts of the country for more than six months.

If the Society will do me the honour of conferring their Medal on me, I will send them a model, and conform most strictly to their rules.

I am, Sir,

Your most obedient

humble servant,

W. LESTER.

*Paddington-Green, May 18, 1808.*

TO C. TAYLOR, M. D. SEC.

SIR,

AGREEABLE to your request I have procured the enclosed Certificates, &c. on the utility of my improved root washer, which you will have the goodness to lay before the Society.

I have no doubt but it would save half the labour in washing potatoes in London, if it were brought into use: It is obvious to every one who has seen it work, that it is greatly superior

superior to the tub and levers used by the potatoe-merchants, as it is not so liable to injure the roots. The soil is drawn from them with more facility, and their falling into the basket from the cylinder is more clean and commodious by far than taking them out of the tub with a grated shovel, from the corners of which many roots are bruised; it also prevents the potatoes being injured in quality from being long soaked in water, from which they suffer greatly in the common way.

I am, Sir,

Your most obedient  
and humble servant,

W. LESTER.

*Paddington-Green, May 8, 1809.*

TO C. TAYLOR, M. D. SEC.



*Certificates of the Utility of Mr. Lester's Machine  
for Washing Tuberous Roots.*

SIR,

IN reply to your enquiries respecting the utility of the root-washer, which I purchased of you about twelve months since, I have much satisfaction in stating, that I have used it, constantly, during the last winter, and have found it to answer the purpose for which it is intended most thoroughly; and if my opinion will be of any benefit to you, I have not the least objection to your making it public.

I am, Sir,

Your obedient humble servant,

JAMES JOHN FARQUHARSON.

*Langton-House, May 2, 1809.*

TO MR. LESTER, &c. &c. &c.

D

*S. A.*

SIR,

IN answer to your's I have to observe, I consider your root-washer to be a machine that no farmer, who is in the habit of giving roots to his stock, ought to be without. I use it constantly in washing potatoes for 150 fattening sheep, besides hogs. A man, and a boy ten years old, will wash, without any exertion, 20 bushels an hour, or a man alone will do half the quantity. I have tried a few parsnips with it, and find it do them equally as well, and have no doubt but any kind of roots may be washed with it. I am very much pleased with it, and so must every one who has tried it.

With every wish for your success,

I am, your's sincerely,

JOHN CLARKE.

*New-Park, Hadlow, Kent,*

*May 4, 1809.*

TO MR. LESTER, &c.

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LORD NORTHAMPTON acquaints Mr. Lester, that the potatoe-washer that was bought of him answers the purpose perfectly well, and is approved by all who have used it.

*Castle-Ashby, May 5, 1809.*

TO MR. LESTER, &c.

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*Description of Mr. Lester's Machine for Washing Potatoes, &c. Plate I. Fig. 1.*

THIS machine is shown in plate I. fig. 1. The potatoes are put into a cylinder or lantern A A, formed of two circular

*Mr. Salisbury's method*

*of Training Vines.*

*Mr. Lister's,  
Potatoe Washer.*

Fig. 3.

Fig. 1.

Fig. 3.



cular boards, and a number of staves connecting them. Six of these staves are connected at the ends of two pieces of wood, so that they can be opened as a door, to put in or take out the potatoes. The cylinder turns round in a trough B B, filled with water and supported on four legs. On the end of the axis of the cylinder, two pulleys, one of which is shewn separately at D, are loosely fitted, these are intended for the cylinder to move upon, when full of potatoes; they run upon a swinging frame E E, which rests on centers at F F: when the long ends of the frame are pulled down, the other end is raised up, lifting the cylinder out of the trough B B; when the long end of the frame becomes the lowest, the cylinder rolls down on its wheels D, till it is over the hopper or wooden funnel G, under which a wheelbarrow or basket to receive the clean potatoes is placed: the door of the cylinder is now opened, and the contents turned out through the hopper into the vessel beneath it. When the frame is in this situation, the iron rods H, which are jointed to the short ends of the levers, form stops to the farther descent of the frame.

When fresh quantities of potatoes are to be washed, they are thrown in at the door of the cylinder, which is then shut up, and held shut by two small bolts. The end of the frame E is then raised up, so as to make the short end the lowest, and the cylinder runs down on its two wheels D over the trough B, till it is stopped by two iron prongs fixed on the end of the frame E; the cylinder is then suffered to fall down into the trough, and the potatoes, &c. are washed by turning it round by its handle K. a is a plug to let out the foul water.

Any person who has seen the laborious and imperfect method of washing potatoes in a tub, as practised in London, will be convinced of the utility of this machine, and

of its preserving the potatoes from being water soaked and spoiled, which is the case when they are long immersed in water.

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*TWENTY GUINEAS were this Session voted to Mr. WILLIAM SALISBURY, of the Botanic Gardens at Brompton and Sloane-street, for his Method of Packing Plants and Trees intended for Exportation, so as to preserve their vegetative powers for many months. The following Communications were received from him.*

SIR,

WHEN I had the pleasure of seeing you last spring, I mentioned a supposed discovery I had made of a substance that would preserve trees and plants for a considerable time in a growing state, when packed up in close boxes, and that by this method they might be sent abroad to great distances with more success and less trouble than in any other. I now take the liberty of troubling you with the results of several experiments which I have since made, being certain that a greater demand will be found for the various articles cultivated in this country, and the persons who are engaged in that trade benefitted, when it is publicly known.

A box I have now sent, marked No. 1, contains specimens of tulip trees and liquid amber tress, which were packed up close from September 1807, till March 1808; they were then planted in my nursery; and the whole, amounting to several hundreds, have grown equally as well as they would have

have done if only transplanted from one part to another of the same ground.

In February last I sent to Boston in New England two packages in this way, each containing upwards of nine hundred trees of different kinds, and I have lately received the pleasing intelligence that they have all arrived safe and done well, but that some fruit trees sent to the same gentleman, packed in the usual way, were all spoiled, owing to the heat of the hold of the vessel in which all the packages were placed.

The other box I now send to you, marked No. 2, contains specimens of different trees which were packed up by my order, some of which have been in the boxes four months, and others a longer period, and the remainder now in the boxes are all in a similar state of preservation, and I have little doubt will remain three months longer, or more, without injury.

I must beg leave to observe, that the principal cause why things of this nature do not succeed in long journeys is, that if the package, (as is commonly the case) becomes by any means damp, it is very liable to heat, and the contents to be thereby very much injured; and if left dry, the moisture of the trees becomes exhausted, and they consequently die for want of nourishment. The mode recommended some years ago by Mr. Ellis, of planting the articles in tubs or boxes of earth, is attended with so much trouble, that it has been seldom found to succeed.

In packing my plants I make use of the long white moss, the *Spagnum palustre* of Linnæus, which grows in great plenty on peat bogs, and when decayed forms a great portion of that substance. It differs materially from other vegetables in possessing the power of retaining moisture in a wonderful degree, and it does not appear to be liable to fer-

mentation in any situation, even when laid together in great quantities; hence a decomposition does not readily take place, and it preserves the power of affording moisture and nutriment to plants when completely enveloped in it, as appears by the above experiment.

I am, with great respect, Sir,

Your very obedient

and most humble servant,

WILLIAM SALISBURY.

*Botanic Garden, Brompton,*

*Jan. 9, 1809.*

TO C. TAYLOR, M.D. SEC.

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WE hereby certify that we packed up the several trees and plants at the times marked on the labels of those in the box No. 2, by desire of Mr. Salisbury, and that the said specimens have remained ever since in the boxes as above described.

ALEXANDER REITH,

JOHN WOODHOOD.

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DEAR SIR,

THE prosperity of a country was never more rapidly promoted than we have happily witnessed in our own nation within a few years, since the study of natural history has become so general amongst all ranks of society; and probably nothing has contributed so much thereto as the extended knowledge of botany, and the numerous collections of vegetable productions which have lately been introduced  
from



from all parts of the world. From such sources our agriculture, and many of the arts, have been greatly improved, yet much still remains to be accomplished by the assiduous botanist; for instance, neither the plants producing the cinchona, or which nourish the cochineal, have yet reached our soil, nor are we even acquainted with those which yield many of our most useful drugs. This is owing, in a great measure, to the difficulty of procuring perfect seeds, it being a well known fact that many kinds will not vegetate if left dry but a short time after gathering; and the difficulty of keeping plants alive during long voyages has been almost an insuperable obstacle. Impressed, therefore, with the importance of the subject, I wrote to you on the 9th of January last, and have now the pleasure of communicating to the Society of Arts, &c. for the benefit of the public, further particulars of the mode I have discovered, and by which I am convinced, from actual experiments, trees or plants of all kinds may, with ease and certainty, be transported from any part of the globe to this country and our colonies; being confident that our commerce will be improved by a more certain mode of exporting the numerous fruits with which our nurseries exclusively abound.

I had, sometime ago, an opportunity of viewing a large heap of moss (*Spagnum palustre*, Linn.) which had been collected for decorating a grotto. I observed that although it had lain exposed for several months in the heat of summer, yet with the exception of the very outside of the heap, its particles appeared in the same state as when first collected, and that a gentle state of vegetation was still going on. I moreover observed, that several species of heaths, grasses, and plants, that had been by chance collected in the heap were preserved, and in several instances had the same appear-

ances as when growing, others were a little blanched for want of light; but even these were alive and capable of growing by proper management. These circumstances led me to make some experiments to ascertain how long trees of different kinds might be preserved in this substance, when excluded from the external air, and I so far succeeded as to keep them for six months, part of which time had been extreme hot weather, and I had afterwards the pleasure of getting them to grow in my garden equal to any that had been transplanted the same season.

As I have endeavoured to discover what property this particular moss possesses when compared with others generally used for packing plants, I shall remark, that, as its name implies, it is in a great measure an aquatic, and consequently not liable to injury from moisture, which it has the power of retaining in a wonderful degree, whilst all the species of *Hypnum* cannot be prevented from rotting, unless they are kept perfectly dry; and although the mosses in general, when moistened with water, are useful to wrap round the roots of trees when packed up, yet they gradually undergo a decomposition, and consequently if plants were completely enveloped therein, they would decay in time from the same cause, which I have proved in many instances.

I was therefore led to ascribe the advantages which the *spagnum palustre* possesses, to its property of holding water, and resisting fermentation, and I am confirmed in this opinion, by a letter which I have received from my worthy friend Mr. A. T. Thompson, to whom I had submitted some of that moss, for a chemical analysis, and whose letter I now inclose.

The manner in which I have been accustomed to pack  
up

up plants is as follows. When the moss is collected from the bogs in which it grows, it should be pressed, in order to drain out as much moisture as possible, and having boxes prepared of sufficient size for the young trees, (which may in some instances be shortened in their branches), I lay in the bottom of the box as much moss as will, when pressed with the foot, remain of the thickness of four inches. A layer of the plants should then be put thereon, observing that the shoots of each other do not touch, and that the space of four inches be left round the sides; after this, another layer of moss, about two inches thick, is placed, and then more plants; and I thus proceed, till after the whole of the plants are pressed down as tight as possible, and the box filled within four inches of the top, which space must be filled with the moss; the contents are then trodden down with the foot, and the box nailed closely up.

When trees are intended to be sent to distant countries, I should advise such to be selected as are small and healthy, and when arrived at their place of destination, they should be cut down quite close, even to the second or third eye from the graft, or in trees not grafted, as near the former year's wood as possible; and having prepared beds according to the following mode, let them be planted therein, to serve as a nursery; for trees of every description, suffer so much from removal, that unless the weather is particularly favourable, they do not recover it for some time, even when only transplanted in their native climate. I do not think it advisable, therefore, to plant them at once, where they are liable to suffer from want of water, and other attentions necessary to their perfect growth. I therefore recommend beds to be thus prepared for them, viz. On some level spot of ground, mark out beds five feet wide, and leave walks

or

or alleys between them, of two feet wide, throwing a portion of the earth out of the beds upon the alleys, so as to leave them four inches higher than the beds.

If the ground is shallow, and the under stratum not fit for the growth of trees, the whole should be removed, and the beds made good with a better soil.

The advantage arising from planting trees in this way is, that the beds being lower than the walks, the water which is poured on, for support of the trees, is prevented from running off. The plants are also less exposed to the influence of the winds, and if a dry and hot season should immediately follow after they are planted, hoops covered with matts, straw, or canvas, may be placed over them, to prevent the sun from burning the plants, and to hinder a too speedy evaporation of moisture.

In warm climates, canvas cloth will answer best for these shades, to be fixed during the heat of the day, so as to prevent the surface of the mold from becoming dry, and if a little water be sprinkled upon the canvas, once or twice during the day, it will keep it tight, and produce a moist atmosphere underneath, which will greatly facilitate the growth of the plants.

These shades should be removed at the setting of the sun, and the plants then watered, when they will also receive the benefit of the dews during the night. In the morning the shades should be replaced, and the plants thus protected till they can stand the open air, to which they should gradually be enured by removing the shades daily more and more, till they can be wholly taken away.

The plants should be planted in rows across the beds, at about three inches distance from each other, and the rows should be about nine inches apart, and when the plants have  
grown

grown thus for one year, they may be removed to the places where they are intended to remain.

I remain, dear Sir,

Your obedient servant,

WM. SALISBURY.

*Sloane-street, March 1st, 1809.*

TO C. TAYLOR, M. D. SEC.

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DEAR SIR,

THE analysis of the moss which you put into my hands, has afforded the following result.

A portion of it macerated in boiling distilled water, for twenty-eight hours, yielded a pale straw-coloured, slightly mucilaginous infusion, which was nearly insipid, and of a disagreeable odour.

The infusion of litmus was reddened when added to it. With the nitrat and acetite of barytes, insoluble precipitates were thrown down, as was also the case with the acetite of lead. Sulphat of iron gave a very slight olive tinge to the infusion, after standing eight hours; and with the solution of gelatin, a small quantity of a whitish flocculent precipitate was formed, after standing twelve hours. The oxalic acid, a solution of pure ammonia, and the nitrat of silver, produced no effect on the infusion.

The conclusion to be drawn from these results is, that the moss contains in its composition, *besides the ordinary principles of vegetables, a very small portion of gallic acid, and of tannin, some sulphuric acid, in an uncombined state, mucilage, and extractive matter.* No inference can, therefore,

fore, be drawn from these results, which explains in any degree the effects of the moss in preserving the vegetables that are enveloped in it; nor is there any effect produced in the air by it, more than is produced by mosses in general when in an uncorrupted state; other causes to explain the preservative property of the moss must therefore be looked for, and these are to be found, in my opinion, in the peculiar qualities of the moss, connected *with its own existence as a living plant.*

Plants which are taken from the earth, and packed up to be sent abroad, or to any distance so considerable as to keep them for some length of time in the package, will not vegetate when again taken out of it and planted, unless some degree of vitality has been preserved during the period that they have been out of the ground.

To preserve this, four circumstances are essential in the packing material; softness, in order that the delicate parts of the enveloped vegetable be not injured; looseness, that a certain portion of air be contained in it, and that an equal temperature may be preserved; moisture, and the power of resisting fermentation, and the putrefactive process. All of these circumstances this moss possesses in a remarkable degree; its power of absorbing and retaining moisture is more considerable than that which perhaps any other moss possesses, it is light, soft, and loose in its texture, and its vitality is so considerable, as to carry on the powers of vegetation, and consequently to enable it to resist fermentation and putrefaction for a very great length of time.

Placed under such circumstances, the plants which are packed up in the moss, enjoy a kind of life in some degree similar to that enjoyed by an animal in a torpid state, the functions of life are supported at a very low state, but still sufficient to preserve them in a situation to be acted upon,  
by

By favourable circumstances when again planted. Such is the theory I have formed of the effect of this moss in preserving plants; the many necessary calls of my profession have not allowed me time sufficient to investigate the subject, with all the attention I could have wished to have bestowed on it, and must also plead my apology, for the hasty manner in which my opinion is presented to you. I consider the discovery of much value, both to Botany and Agriculture.

Believe me

Your's truly,

A. T. THOMPSON.

*February 15th, 1809.*

To Mr. W. M. SALISBURY.

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DEAR SIR,

IN addition to the account which I delivered to you, respecting my method of packing plants for exportation, in the *spagnum palustre* moss, I beg leave to observe, that at the time the case was packed up, which I sent to the Adelphi in January last, a similar package was sent from me to Sierra Leone, by desire of the African Institution, who wished to introduce into that colony the mulberry tree for feeding silk worms; also different kinds of vines, and other fruit trees, amounting in the whole to nearly fifteen hundred trees.

They arrived there in about four months after the package was made up, and the trees were planted under the direction of a gentleman, to whom I gave a copy of the instructions.

structions which accompanied my former letter to you of last January. The following account of them has since appeared in the African Herald. “ A number of fruit and  
 “ other trees, amongst which are the white and red mul-  
 “ berry, vines, &c. have been sent from London, by order  
 “ of the African Institution, all of which at present are  
 “ growing here, in a very flourishing state, and a piece of  
 “ ground is clearing in the mountains, to which they are  
 “ intended to be removed the next season.”

I requested the gentleman, to whose management the plants were entrusted, to acquaint me how they succeeded, and to use the same moss in packing up for me, some of the wild plants of that neighbourhood, which he did in June last, and at the same time I received a letter from Mr. Macaulay of that place, with the following intelligence. “ The  
 “ plants which were bought of you, and sent out by the  
 “ African Institution, all thrive very well, except the tea-  
 “ tree, sour sop, and a few others. The mulberries, &c.  
 “ grow most luxuriantly ; most of the trees have been re-  
 “ moved to a more temperate situation, about three miles  
 “ from hence, where the remainder will soon also be  
 “ planted.”

This letter arrived by the Derwent, Captain Colombine, who also brought me a box of plants packed up in the moss which had been previously sent with the above ; and although the package did not arrive at Brompton before the 5th of October last, the plants were in a fine state of vegetation, and are now growing in my hot-house, and even the moss itself had preserved its vegetative state, and was perfect.

I have been thus particular in my description of the fact, as it is a corroborating proof of the utility of this moss for such purposes, and as the removal of trees cannot be other-

wise



wise effected in long voyages, without great expense and inconvenience.

I am, with great respect, Dear Sir,

Your's very truly,

WILLIAM SALISBURY.

*Botanic Gardens, Brompton,*

*Nov. 18th, 1809.*

TO C. TAYLOR, M. D. SEC.

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*Reference to Mr. Salisbury's Method of managing  
Plants, after they are removed from the Package.  
See Plate I. Fig. 2, 3.*

The plan fig. 2, at the bottom of plate 1, represents on a small scale, sections of the beds and alleys, with the plants as first set. The beds *a a*, are to be made on level ground, each bed to be five feet wide, with a space *b b b* between each for a road. A portion of the earth, is to be thrown out of the five feet beds, upon these roads, so as to raise them four inches higher than the beds, as shown in the plan; *C* represents the plants as first set out, with an arched cover of canvas cloth over them; *D* shows the plants when they have grown in the beds for some time, and in a state ready for planting out.

To illustrate the mode of cutting or pruning the plants, after they are removed from the package, fig. 3; No 1, is supposed to be a fruit tree, of one year's growth from the graft, that is a maiden plant. It is to be cut down as is represented in No. 2, and the next season's growth will form the tree No. 3. When it is fit to remain as a dwarf, or if pruned, as is represented in No. 4, it will form a standard, or such as are usually planted in orchards with high stems,  
in

in order to be out of the reach of cattle. No. 5, is supposed to represent any small tree that has not been grafted, but cut down for planting. No. 6, is the form it will make the following season, when it may be left, or should it be intended for timber, or having a crooked stem, cut it close down to the ground as at No. 7, and it will throw up several shoots, which should be all cut off but the strongest, and that will make the tree No. 8. This may afterwards be kept trimmed up to a single stem, and a tree be formed much better than in any other mode.

N. B. The packages of plants, Nos. 1 and 2, mentioned in Mr. Salisbury's first letter, were opened and examined by the Committee of Agriculture, on the 16th of January 1809, when all the plants appeared to be in a state fit for vegetation. The boxes were then closed, and placed in the Society's model room, and opened again on the 30th May, at the distribution of the Rewards of the Society; the plants were then in a state fit for growth, having formed both new roots and branches during their confinement. It appears, therefore, that the plants were from their first inclosure by Mr. Salisbury, thus preserved nine months out of the earth.

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*The SILVER MEDAL of the Society was this Session voted to CHARLES LE HARDY, Esq. of the Island of Jersey, for the following Communication on the Culture of Parsnips, and their Utility in Feeding Cattle.*

SIR,

HAVING observed in the book of Premiums offered by the Society, that they wished for information on the culture of parsnips,

parsnips, which are much used in the island of Jersey; as having practised it for many years, I take the liberty to communicate what I know on the subject, with the result of some comparative experiments.

The culture of parsnips and beans, is looked upon as one of the regular courses of crops in the island. There is no farmer, be the extent of his grounds ever so small, who does not yearly plant a proportionate quantity, for the purpose of fattening his hogs and cattle, or of feeding his milch cows.

A few years ago, the culture of potatoes was substituted by some farmers to that of parsnips, and apparently with advantage; but further experience, has brought them back again to their former practice. Potatoes produce more weight and measure on a given extent of ground, and may be cultivated with less expense; still the parsnip is found to answer best for the farmer's purpose. A perch of the island, which is twenty-four square feet, will produce on an average crop, seven cabots of potatoes, each weighing forty pounds, the same extent in parsnips will only average six cabots, which weigh only thirty-five pounds each, making twenty pounds weight in favour of the potatoes, but they are not so nutritious as parsnips.

Parsnips will thrive almost any where, but better in a deep stiff loam. They are generally cultivated in the island after a crop of barley, in the following manner.—At the end of January or the beginning of February, the soil which requires for that purpose to be stirred from the bottom, is either dug with spades after a skimming plough, or with two ploughs of different shapes following one another. The latter of the two, invented some years ago by a farmer in the island, will go to a depth of fifteen inches. In both these ways, the neighbouring farmers assist each other: In

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the

the season, it is not uncommon to see forty or fifty men in one field digging after a plough. When the large plough is used, less men are required, but more strength of cattle; two oxen and six horses are the team generally used. Those days are reckoned days of recreation, and tend to promote social intercourse amongst that class of men.

After the ground has been tilled in this way, it is coarsely harrowed, and a sufficient number of women are provided to plant beans. These are dibbled in rows three by three ::::: at the distance of five feet from row to row. Two women may plant one vergee in a day. Two vergees and a half being equal to an English acre. Three sixtenniers of parsnip seed, (about  $\frac{1}{4}$  of a Winchester bushel) are then sown upon each vergee, and the whole is finely harrowed.

This crop now requires no attendance till the month of May, when weeding becomes necessary. This is the most expensive part of the culture. It is generally done by hand, with a small weeding fork, and as the parsnips require to be kept very clean, the expense is proportionate to the quantity of weeds. This last summer four women were employed twenty-eight days each in weeding about five vergees. I tried a few perches with the hand-hoe, and thinned them like turnips; they proved finer than those which were hand-weeded. In Guernsey they make use of the spade for that purpose.

In the beginning of September, the beans are pulled up from among the parsnips, and about the latter end the digging begins. The instrument used, is the common three-pronged fork. This work is done gradually as the cattle want them, till the ground requires to be cleared for sowing wheat; which after parsnips is generally done about the middle of December. They are reckoned an excellent fallow for that kind of grain, and the finest crops are generally

rally those which succeed them ; as it is a tap-rooted plant, it does not, like the potatoe, impoverish the surface, but leaves it mellow and free from weeds, to a succeeding crop.

When parsnips require to be kept for the use of cattle, they are brought dry under sheds, and will keep good without any care till the end of March. Should they require to be kept longer, they are layed in double rows over one another, their heads outward, with alternate strata of earth, which when finished, have the appearance of small walls, or if made circular of small towers. Those for seed are always preserved in this manner, and sometimes carrots and beets for culinary purposes.

Parsnips are not injured by frost ; after having been frozen, they are fit for vegetation ; the only sensible alteration is their acquiring a sweeter taste, and by that perhaps becoming more nutritive. They are given raw to hogs and to horned cattle. Though horses are fond of these roots, they are not suffered to eat them, as they make them languid, and are apt to injure their sight. Their leaves when wet are so caustic as to blister the hands of the weeders, and sometimes to occasion a violent inflammation in the eyes and udders of the cattle feeding upon them.

Cows fed on parsnips in the winter months, give a greater quantity of milk and butter, and of better flavour, than those fed upon potatoes. The butter is nearly equal to that from spring grass. Though the root of this plant has the quality of improving that article, it must be observed, that the leaves give it a very disagreeable taste, which however is of no consequence when intended to be potted, as it goes off in a short time.

Parsnips are dangerous food for sows before they farrow, and might occasion them to lose their litter. Hogs may be

fattened with them in about six weeks. It is the custom during that time, to thicken their swill with the meal of beans and oats ground together. Pork fattened in this way is very firm, and does not waste in boiling.

Horned cattle may be fattened with parsnips in about three months. I never knew them used for sheep.

It is the general opinion in the island, that hogs or cattle fed on parsnips, may be brought in a condition for slaughtering, in less time, and with half the quantity, that would be required of potatoes. The butchers are sensible of the superiority of the former, and will give a halfpenny per pound more for cattle fattened with them, than for such as have been fed any other way. Upon enquiry I was informed, they always contained a greater quantity of tallow.

This I believe to be a full account of the culture and use of the parsnips, and a just comparison with the potatoe. Should the Society wish any farther information, either on this, or on my Telegraph, I shall think myself in duty bound to give it.

I remain, Sir,

Your most obedient humble servant,

CHARLES LE HARDY.

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I have read with attention the foregoing memoir on Parsnips, and am of opinion, that it is a full and correct statement of the culture of that root in the island of Jersey. I can also certify, that the writer (Major Le Hardy), has made several experiments, which have been much approved of.

F. J. LE COUTEUR,

President of the Jersey Agricultural Society.

We,

We, the undersigned Members of the Society, perfectly agree in the opinion expressed by the President.

FR. LE COUTEUR,  
Rector of Grouville.

P. DURELL.

J. MALLET,  
Rector of St John's.

CHARLES LE MAISTRE.

A. BISSON,  
Rector of St. Laurence's.

*The SILVER MEDAL was this Session voted to the REV. JAMES HALL, of Chesnut Walk, Walthamstow, for preparing from Bean Stalks, a Substitute for Hemp. The following Communication was received from him, and Samples of the Fibres are preserved in the Society's Repository.*

SIR,

**T**HOUGH it has not been attended to, nor, so far as I know, has ever been mentioned by any one, yet it is certain that, according to its size, every bean plant contains from 20 to 35 filaments, or fibres, running up on the outside, under a thin membrane, from the root to the very top all around, the one at each of the four corners being *rather thicker*, and stronger than the rest. It is also certain that, next to Chinese, or sea-grass, in other words, the material with which hooks are sometimes fixed to the end of fishing lines,

the filaments, or hempen particles of the bean plant, are among the strongest yet discovered. These with a little beating, rubbing and shaking, are easily separated from the strawy part, when the plant has been steeped 10 or 12 days in water; or is damp, and in a state approaching to fermentation, or what is commonly called rotting. Washing and pulling it through hackles, or iron combs, first coarse, and then finer, is necessary to the dressing of bean-hemp; and so far as I have yet discovered, the easiest way of separating the filaments from the thin membrane that surrounds them.

From carefully observing the medium number of bean-plants in a square yard, in a variety of fields on both sides the Tweed, as well as in Ireland, and multiplying them by 4840, the number of square yards in an acre, and then weighing the hemp, or filaments of a certain number of these stalks, I find that there are at a medium, about 2cwt. of hemp, or these filaments, in every acre, admirably calculated for being converted into a thousand articles, where strength and durability is of importance, as well as, with a little preparation, into paper of all kinds; even that of the most delicate texture.

Now since there are, at least 200,000 acres of ticks, horse and other beans planted in Great Britain and Ireland, and since where there is not machinery for the purpose, the poor, both young and old, females as well as males, belonging to each of the 9700 parishes in England, &c. where beans are raised, might (hemp having risen of late from 60 to 120 pounds per ton), be advantageously employed in peeling, or otherwise separating these filaments from the strawy part of the plant, after the beans have been threshed out. I leave it to the feelings of the Society for the Encouragement of  
Arts,



Arts, &c. to judge of the importance of the idea held out here, not only to the poor, but to the landholders, and the community at large.

It is nearly twelve months since, by analyzing its component parts, I discovered hemp in the bean plant. I would have written to you then, Sir, on the subject, and sent a specimen, but that I was trying experiments with other plants, as I am during my leisure hours doing at present; and I wished to ascertain in what degree this species of hemp is liable to injury from different situations, and the changes of the atmosphere. With a view to this, I exposed one parcel nearly 12 months, to all the varieties of the air within doors, and kept another nearly as long *constantly* under water, and find them not in the least injured. The chief difference I perceive is, that the one kept constantly under water, namely the *whitest* of the specimens sent you, has assumed a rich silky gloss, and a much more agreeable colour than it had before.

But though this is the case with bean-hemp *after* it is cleaned and dressed, and which, though stiff and hard when dry, is pliable and easily managed when rather damp or wet, it seems otherwise with it *previous* to its being separated from the straw. If bean-straw be kept for years under water, or quite dry, it produces I find hemp as good and fresh as at first. But, if the straw be sometimes wet, and sometimes dry, the filaments or fibres are apt to be injured. The specimens of bean-hemp accompanying this letter, in the form of oakum for caulking ships, having been long exposed to the varieties of the weather, previous to being separated from the straw, is a proof of its being considerably injured. If the straw of the bean was scattered thin on the ground, and exposed to the weather for two or three months, I have uniformly found that the hemp, or fibres,

are loosened, and easily separated from the strawy part, without any other process than *merely* beating, rubbing and shaking them, and perhaps this is the easiest way of obtaining bean-hemp; but then, from being thus exposed, and the fermentation that takes place in the strawy part, which is of a spongy nature, communicating itself to the fibres, or hemp, I find that these are generally less or more injured, though not so much so, in my opinion, as to prevent them from being excellent materials for making paper.

I have also found, and the importance of the idea will, I hope, be an excuse for mentioning it here, that, though the water in which bean-straw has been put to steep, in a few days generally acquires a black colour, a blue scum and a peculiar taste, yet cattle drink it greedily, and seemed fattened by it. But my experiments have hitherto been on too limited a scale to be able, in a satisfactory manner, to ascertain this last circumstance. When the water in which bean straw has been put to steep, becomes foetid, which I find it is *scarcely* more apt to become than common stagnant water, on being stirred by driving horses or cattle through it, by a stick, or in any other way set in motion, (as is the case with all putrid water, even the ocean itself), the foetid particles fly off, and the effluvia dies away.

When straw is to be steeped for bean hemp, the beans are to be threshed in a mill: the beans should be put to the mill, not at *right angles*, but on a *parallel*, or nearly so with the rollers, else the straw, particularly if the beans are very dry, is apt to be much cut. If the straw is *not* to be steeped, on putting the beans to be threshed at right angles, or nearly so, with the rollers of the mill, a certain proportion of the fibres, or hemp, may easily be got from the straw, these being in general not so much cut as the straw; but often found torn off and hanging about it  
like

like fine sewing threads. The hemp thus taken off, though its lying under water for months would do it no harm, requires only to be steeped a few minutes, drawn through a hackle and washed, previous to its being laid up for use. If the hemp, or fibres, collected in this way (which is a fine light business for children, and such as are not able for hard work, and which requires no ingenuity), are intended only for making paper, they require neither steeping nor hacklings, but only to be put up into parcels and kept dry till sent off to the manufacturer.

The straw of beans contains a saccharine juice, and is highly nutritive, perhaps more so than any other; and like clover, the prunings of the vine, the loppings of the fig-tree, &c. produces a *rich* infusion, and uncommonly fine table-beer, as well as an *excellent* spirit by distillation. It is the hemp or fibres that prevents cattle from eating it. These, like hairs in human food, make cattle dislike it. The collecting of it, therefore, should never be neglected, nor the boys and girls in workhouses and other places, be permitted to be idle, while business of this kind would evidently tend both to their own and their employers' advantage.

It is a fact, that about the generality of mills for beating and dressing hemp and flax, a large proportion, in some inland places both of Great Britain and Ireland, amounting nearly to one-half of what is carried thither, is either left there to rot, under the name of refuse, or thrown away as of no use, because too rough and short for being spun and converted into cloth. Now, from the experiments I have tried, and caused to be tried, I have uniformly found, that, though too rough and short for being converted into cloth, even of the coarsest kind, the refuse of hemp and flax, on being

being beat and shaken, so as to separate the strawy from the stringy particles, which can be done in a few minutes by a mill or hand-labour, as is most convenient, becomes thereby as soft and pliable, and as useful for making paper, as the longest, and what is reckoned the most valuable part of the plant, after it has been converted into cloth and worn for years.

In its natural state, it is true the refuse of hemp and flax is generally of a brown and somewhat dark colour. But what of that? By the application of muriatic acid, oil of vitriol, or other cheap ingredient, well known to the chemists, as well as to every bleacher, such refuse, without being *in the least* injured for making paper, can, in a few hours, if necessary, be made as white as the finest cambric.

There are, at a medium, published in London, every morning, 16,000 newspapers, and every evening about 14,000. Of those published every other day there are about 10,000. The Sunday's newspapers amount to about 25,000, and there are *nearly* 20,000 other weekly papers, making in all the enormous sum of 245,000 per week. At a medium 20 newspapers are equal to one pound—hence the whole amount to about 3 tons per week, or 260 tons per annum. But though this, perhaps, is not one-half of the paper expended in London on periodical publications, and what may be called fugacious literature, and not one-fourth part of what is otherwise consumed in printing-houses in the country at large, yet there are materials enough in the refuse of the hemp and flax raised in Britain and Ireland for all this and much more.

Nor is this all, for as the bine or straw of hops, a circumstance well known to the Society, contains an excellent hemp for making many articles, so also will it prove a most  
 excellent

excellent material for making all kinds of paper. And it is a fact, that were even the one-half of the bine of hops raised in the counties of Kent, Sussex, and Worcester, instead of being thrown away, or burnt, after the hops are picked, as is commonly done, steeped for ten or twelve days in water, and beat in the same way as is done with hemp and flax, independent of what might be got from bean-hemp, and a variety of articles well-known to the Society, there would be found annually materials enough for three times the quantity of paper used in the British dominions.

I have the honour to be,

with much respect,

Sir,

Your most humble servant,

JAMES HALL.

*Streatham, Jan. 9, 1809.*

TO C. TAYLOR, M. D. SEC.

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*Certificates of the Truth of the foregoing Statement.*

*Streatham, Surry, Jan. 9, 1809.*

WE, the undersigned, do hereby certify, that the specimens of hemp inclosed and sealed up by us, addressed to Dr. TAYLOR, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce, Adelphi, Strand, are the produce of common bean straw:—That we never saw nor heard of bean hemp till lately: when the Rev. James Hall, who resides here at present, was trying experiments

experiments respecting it at Mr. Adams's farm, Mount Nod, and other parts of this parish :—That, in the present obstructed state of commerce with the Continent, it appears to us the discovery of bean hemp may be extremely useful to the manufacture of canvas, ropes, paper, &c. ;—And that, as it affords a new and important prospect of employment for the poor, we think Mr. Hall, the discoverer, is deserving of the approbation of the public. We shall only add, that as the Society for the Encouragement of Arts, Manufactures, and Commerce, have contributed so often in a high degree to the exertion of genius, the improvement of the arts, and the public good, we have no doubt but they will not only take the proper steps to prosecute the discovery and encourage the manufacture of bean hemp, but also, by some mark of their favour, show their approbation of Mr. Hall's merit in the discovery he has made, as well as of his high public spirit and liberality in communicating the discovery to the public without reserve.

WILLIAM ADAMS, Mount Nod.

EDWARD BULLOCK, Curate.

WM. GARDNER, Surgeon.

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*Streatham, Surry, Jan. 9, 1809.*

THESE are to certify to the Secretary of the Society for the Encouragement of Arts, &c. London, and all whom it may concern, that having seen (at first to our astonishment) the Rev. James Hall, who has resided here for some time past, procuring hemp from common bean straw, steeped some days in water, we steeped some also, and easily got  
hemp

hemp from it; there being no mystery in the matter more than *merely* steeping the straw, peeling off the hemp, and then washing and cleaning it, by pulling it through a hackle or comb.

These are also to certify, that having tried bean hemp, and found it to take both wax and rosin, we have sewed with it, and find the fibres of which it consists in general so strong, that the leather never failed to give way sooner than the seam. We have only to add, that as hemp has of late become uncommonly dear, while much of it is bad, we anxiously wish the prosecution of the discovery, and the appearance of bean hemp in the market; and shall, so soon as we hear of its being spun and on sale, be among the first to purchase and use it.

JOHN HOUNE, Shoemaker.

THOMAS ALFORD, Shoemaker.



*Letter from Mr. Hume, of Long Acre, to the Rev.  
James Hall.*

SIR,

I INCLOSE a specimen of the bean filaments or thread which have been submitted to the bleaching process. The texture and strength seem not in the least to have been impaired, but retain the primitive tenacity; and I am persuaded this substance will prove an excellent substitute for hemp and flax, for the manufacture of various kinds of paper, cordage, and other materials. I did not find more difficulty in accomplishing the bleaching of this than in other vegetables

tables which I have occasionally tried, and I believe this article is susceptible of a still greater degree of whiteness.

I remain, Sir,

Your very obedient servant,

JOS. HUME.

*Long Acre, Feb. 24, 1807.*



*Letter from Mr. H. Davy to the Rev. James Hall.*

SIR,

I SHALL inclose in this paper a small quantity of the bean fibre, rendered as white as possible by chemical means.

It seems to bear bleaching very well, and as to chemical properties, differs very little from hemp.

The question, whether it is likely to be of useful application, is a *mechanical* one, and must be solved by experiments on its comparative strength.

I am, Sir,

Your obedient humble servant,

H. DAVY.

*The*



*The SILVER MEDAL of the Society was this Session voted to Mr. WILLIAM SALISBURY, of the Botanic Gardens, Brompton and Sloane Street, for Raising Grass Seeds, and Preparing Meadow Land. The following Communications were received from him, and a Sample of the Seed preserved in the Society's Repository.*

SIR,

I OBSERVE in a List of Premiums offered by the Society of Arts, &c. which fell into my hands, that the subject of select grass seeds has engaged their attention. I have, therefore, taken the liberty of sending herewith a sample of *Festuca pratensis* or Meadow fescue grass, which has been grown under my directions; it is a sample of upwards of twenty quarters, the produce of twelve acres of land, which have now been under that crop for the three last years.

As the cultivation of grasses, in general, hath engaged my attention very particularly for the last twenty years, I have had an opportunity of observing more attentively their several qualities, and must beg leave to observe, that the opinion formed by Mr. Curtis and others of the two species of *poa*, have been proved to be erroneous in several respects, and which it will be highly proper hereafter to notice, as I have found, after numerous experiments, that neither of them is likely ever to be brought into general cultivation, for several reasons which I have fully ascertained from facts. If the mode I have practised of managing the *fescue*, *fox-tail*, and other grasses, whether with the view of producing  
seed,

seed, or the best mode of using them in forming pasture and meadow-land, be deserving the notice of the Society, I shall be happy at a future period to send it to you.

I beg leave to mention, that there are several meadows at Roehampton, the property of the late Benjamin Goldsmid, Esq. which have been made at different times under my management with the grass seed I had previously raised, and which will challenge any other grass land in similar situations in the kingdom. The turf and pasturage of them were formed in less time by far than is to be done by the usual modes practised.

I am, most respectfully, Sir,

Your very humble servant,

WILLIAM SALISBURY.

*Brompton Botanic Garden,  
March 6, 1809.*

TO C. TAYLOR, M. D. SEC.

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Certificates were received, dated March 5, 1809, from WILLIAM UNDERELL, RICHARD HOOK, and THOMAS HOOK, stating, that in the year 1808 there was grown upon Lee-Place Farm, near Godstone, in Surry, in the occupation of Mr. Pennington, one hundred and sixty-five bushels of Meadow fescue grass seed, which was produced from about twelve acres of land, and that it was free from mixture of other grasses or weeds, and that they assisted in harvesting and threshing the whole.

*Observations*

*Observations, in addition to the preceding Statement, on the Method of laying down Pasture and Meadow Land, with Account of some Pastures made with the Festuca Pratensis, Linn., or Meadow Fescue-Grass and Clovers, by Mr. William Salisbury.*

DEAR SIR,

IT is now nearly thirty years since my much respected friend and partner, Mr. Curtis, wrote his Observations on several of our native grasses, better adapted to the purposes of pasture than ray-grass, the only species of these various tribes that was then, or even now, generally used for the purpose; yet it is acknowledged, by all persons conversant on this subject, that it is inferior to many others, both in produce and nutriment, and also that it remains in the ground but a short time, a fact which attaches also to all the clovers, and is to be lamented by the grazier.

I have been often more mortified than surprised to find, that after so much has been written on this interesting subject, and when other grass seeds may be obtained, that almost every person is of opinion, that they cannot be cultivated to advantage. I am ready to admit much truth in this, when they are sown according to the common system in practice, which I have frequently convinced myself and others to be erroneous, and that it prevents these useful plants from succeeding after the seeds have been sown.

It will readily be supposed that I allude to the mode of laying down land to grass under a crop of spring corn, and I am fully sensible that many persons will say that it would be madness to sacrifice the benefit of a crop of barley or oats,

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where

where the land is in fine order, and whilst we can have a crop of grass under it.

To this I reply, that there is no land whatever, when left for a few months in a state of rest, but will produce naturally some kind of herbage, good and bad; and thus we find the industry of man excited, and the application of the hoe and the weeder continually among all our crops, this being essential to their welfare. I cannot help, therefore, observing, how extremely absurd it is to endeavour to form clean and good pasturage under a crop that gives as much protection to every noxious weed as to the young grass itself\*. Weeds are of two descriptions, and each require a very different mode of extermination: thus if annual, as the charlock and poppy, they will flower among the corn, and the seeds will ripen and drop before harvest, and be ready to vegetate as soon as the corn is removed; and if perennial, as thistles, docks, couch-grass, and a long tribe of others in this way, well known to the farmer, they will be found to take such firm possession of the ground that they will not be got rid of without great trouble and expense.

Although the crop of corn thus obtained is valuable, yet when a good and permanent meadow is wanted, and when all the strength of the land is required to nurture the young grass thus robbed and injured, the proprietor is often at considerable expense the second year for manure, which taking into consideration the trouble and disadvantage at-

\* I do not wish it to be understood that I allude to the system practised in Surry and other counties, of sowing clover and rye-grass under barley, when it is intended only for a season or two, in order to change the course of crop, and to be returned again to arable crops as soon as the clover is exhausted, or what is more frequently the case, overpowered with the weeds that have been nurtured with it; this is totally different, and is not intended for a permanent crop.

tending

tending it, more than counterbalance the profit of the corn crop.

To accomplish fully the formation of permanent meadows three things are necessary, namely, to clean the land, to procure good and perfect seeds adapted to the nature of the soil, and to keep the crop clean by eradicating all the weeds, till the grasses have grown sufficiently to prevent the introduction of other plants. The first of these matters is known to every good farmer,—the second may be obtained,—and the third may be accomplished by practising the modes in which I have succeeded at a small comparative expense and trouble, and which is instanced in a meadow immediately fronting Brompton Crescent, the property of Angus Macdonald, Esq. which land was very greatly encumbered with noxious weeds of all kinds, but, by the following plan, the grasses were encouraged to grow up to the exclusion of all other plants, and though it has been laid down six years, the pasturage is now at least equal to any in the county.



*Method of laying down Land in Grass.*

Grass seeds may be sown with equal advantage both in spring and autumn; the land above-mentioned was sown in the latter end of August, and the seed made use of was one bushel of meadow fescue, and one of meadow fox-tail grass, with a mixture of fifteen pounds of white clover and trefoil; the land was previously cleaned as far as possible with the plough and harrows, and the seeds sown and covered in the usual way. In the month of October following, a most prodigious crop of annual weeds of many kinds had grown up, were in bloom, and covered the ground and the sown grasses; the whole was then mowed and carried off the land,

and by this management all the annual weeds were at once destroyed, as they will not spring again if cut down when in bloom. Thus whilst the stalks and roots of the annual weeds were decaying, the sown grasses were getting strength, during the fine weather, and what few perennial weeds were amongst them, were pulled up by hand in their young state. The whole land was repeatedly rolled to prevent the worms and frost from throwing the plants out of the ground; and in the following spring it was grazed till the latter end of March, when it was left for hay, and has ever since continued a good field of grass.

The meadows at Roehampton, belonging to the late B. Goldsmid, Esq. were laid down with two bushels of meadow fescue-grass, and fifteen pounds of mixed clover, and sown in the spring along with one peck and a half of barley, intended as a shade to the young grasses; the crop was thus suffered to grow till the latter end of June, and then the corn, with the weeds, were mowed and carried off the land; the ground was then rolled, and at the end of July the grasses were so much grown as to admit good grazing for sheep, which were kept thereon for several weeks. It should be observed, that the corn is to be mowed whilst in bloom, and when there is an appearance of, or immediately after rain, which will be an advantage to the grasses, and occasion them to thrive greatly.

I sowed some fields for the same gentleman in autumn in the same way, and found them to succeed equally well.

I intended to have made some remarks on some properties which had escaped Mr. Curtis's notice in his Observations, and which do not add to the celebrity of all the grasses he has mentioned, but as I have partly prepared a short history of the nature of all our plants used in agriculture, so far as relates to their properties in a wild state, and the

the effect of cultivation upon them, I shall, for the present, defer any further remarks thereon.

I remain, dear Sir,

Your very obedient servant,

WILLIAM SALISBURY.

*Botanic Garden, Brompton,  
August 1, 1809.*

TO C. TAYLOR, M. D. SEC.

*The THANKS of the Society were this Session voted to Mr. JOHN SADDINGTON, of Finchley, for his Communication of the following comparative Experiments on the Culture and Application of Kohl Rabi, Drum-headed Cabbage, and Swedish Turnips,*

SIR,

BEING actuated by the most patriotic motives, I beg the favour of you to lay the following Communication before the Society of Arts, together with the plants herewith sent. I will endeavour to give you an account with as much brevity as is in my power to render myself intelligible, of the nature of the soil, the mode of cropping, and the produce thereof, the plot of land being about two and a half acres, and laying on a dead flat. I obtained leave in 1805 to under-drain and break up the same, the grass being sour and useless.

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I cut two main drains, forty-two inches deep, gradually rising at top to twenty-eight inches, to give a sufficient fall, with sixteen branches twenty-four inches deep, rising to sixteen inches, terminating at top like the letter Y: the drains were wooded with elm, and laid with my own hands; this work was done in February. The soil is a loam, with clay and gravel under. On the 20th March I sowed three and a half bushels of oats per acre, which produced thirty-nine bushels per acre, weighing forty-one pounds per bushel. The straw was used as it was threshed for litter to stalled oxen. The 28th of September seeded with winter tares four bushels of seed per acre. Eat them off in May with sheep. Two fallow ploughings were given in June and August. About two hundred sheep were brought in at nights by way of fold. The 11th of October sowed three bushels of Thanet wheat per acre. Brined and limed in March, twice fed down with sheep. Produce, twenty-nine bushels per acre, weighing fifty-nine pounds per bushel, and very near three and a half load of straw per acre. The stubble was mowed and cleared off, and the land got ready for turnips. Three pounds of seed were sown the last week in August, when the plants were just making their appearance. Two quarters of gypsum were sown by hand to prevent the fly, which had the desired effect.

This proved a very valuable crop; having two hundred ewes which gave suck, it was a great acquisition to their milk. This induced me to try three experiments last spring with kohlrabi, or purple turnip-cabbage, drum-headed cabbage, and Swedish turnips.

With due respect I beg to recommend to the Society kohlrabi, as a prolific and nutritious plant for the feed of sheep and neat cattle; and green food may be produced by  
this



this means from October until May. To ensure a succession of keep, seed should be sown in March, April, and May. The plant bulbs above the ground; the leaf is much like that of beet; it will stand in defiance to the severest frost; and as a proof thereof, I have cut with my knife several of the plants through the crown two inches deep, and they have stood three months afterwards in a sound state; some of them are here produced. The plants may be transplanted like those of cabbage: many of those transplanted at eighteen inches apart, I have found to weigh ten and eleven pounds a-piece.—I must now beg leave to introduce my method of cultivation, with the average weight of the crop.

On the 14th of May, I sowed four ounces of seed broadcast, and transplanted about forty-six pole therefrom, on the 18th of June, at twelve inches apart each way; the weight of a square pole is seven hundred and thirty-two pounds, on an acre fifty-eight ton six hundred eighty-eight pounds, taking each plant to average three pounds. The beauty and regularity of this crop in my idea overbalanced the trouble of transplanting. I likewise sowed upon a bed in the garden, the second week in March, eight ounces of drum headed cabbage. The fly and slug were very destructive to the plants. I transplanted them the second week in June, upon ridges thirty-six inches apart, the land being dunged at the rate of twelve load per acre. Some of the cabbage weighed thirty pounds. I think the average about twelve pounds each, or twenty-five ton eighteen hundred sixty-four pounds per acre. The caterpillar was very destructive. I have picked off in a morning as many as would fill a quart pot. Although the kohl rabi was planted near to the cabbage, I never saw a caterpillar upon

any of the plants. In the middle of June, I sowed the remainder of the field with Swedish turnips, but lost two-thirds of this crop by the fly. One of the best of the Swedish turnips is here produced, in order to show the great superiority of the kohl rabi, as there is not that waste in being eat upon the ground, as it bulbs above, and the Swedish turnip in the ground. When the sheep have eaten the turnip level with the ground, and scooped out the inside, the remainder serves as a reservoir for the dirt and filth. The produce of this field, has been sufficient for nine score of suckling ewes with rowen for five months. I sent to market at Christmas last, house-lambs fattened with milk only, which weighed eleven stone and one pound each, alive, at eleven weeks old. Should the Society consider these observations worthy of notice, I shall feel myself happy in hearing from you.

I am, Sir,

Very respectfully

Your obedient servant,

JOHN SADDINGTON.

*Finchley, Middlesex,*

*Feb. 13, 1809.*

TO C. TAYLOR, M.D. SEC.

*The*

*The THANKS of the Society were this Session voted to Major SPENCER COCHRANE, of Muirfield-house, near Haddington, North Britain, for the following Communication on the Properties of Furze or Whins.*

SIR,

THE Society having honoured me, by publishing in their 25th Volume, my communication, stating the advantages arising from the culture of poppies, and that seven ounces of fine salad oil were furnished by expression from two pounds of the seed; I now beg leave to add, that I am informed, considerable quantities of poppy seeds have been lately bought up, in different parts of the country, and the expressed oil from them sold at the price of Florence oil; and that emulsions made from poppy seeds, answer in every respect the purposes of those made from almonds.

The following communication may perhaps be deemed worthy the notice of the Society, it relates to the use of Whins or Furze. Its utility as food for cattle has been long known, though probably not sufficiently appreciated, but as a medicine, I never till within a few years heard of it. My information was first received from a gentleman who has been an officer in the army, a friend and relation of mine; he is seventy-five years of age, and in good health, and what he says may be depended upon. In October 1806, he informed me that his sight had been much strengthened by drinking an infusion of whin or furze blossoms, dried in the sun in summer. The infusion is made from a tea-cup full of the blossoms, in a tea-pot in the manner of tea, and the dose half a tumbler at night; that he never had a cough since  
he

he first used it, which was fifty years ago; it acts as a diuretic, and by perspiration, and when the dose is increased, promotes sleep. In October 1808, he informed me that he still continued the use of the whin-tea, that he had no cough, and that his skin was remarkably fine and soft, which he attributes to its use.

I have also used the whin blossoms with good effect myself, and can safely recommend them.

My friend supposes the young shoots of furze may answer if the blossoms cannot be got; he informs me, that when an epidemical cold came from Germany, and destroyed many horses in England, the east wind continued six weeks, and the infection came over to Ireland, where he had the care of a troop, in so poor a village that he could get neither bran nor malt for mashes, which were ordered for the horses with sulphur, after bleeding: That he ordered the men to cut furze, and ordered them to give it to the horses, after they had beat it well on the pavement: that at first they had to mix it with oats, but that in two days the horses devoured it like clover. That by these means he recovered them all, though every other troop lost two or three; and that his was the only troop in good condition at the review.

I remain with esteem, Sir,

Your sincere and humble servant,

SPENCER COCHRANE.

*Muirfield, Jan. 22, 1809.*

TO C. TAYLOR, M. D. SEC.

*The*

*The following Communication was received from Mr.*

*CHARLES WAISTELL, of High Holborn, in Addition to the interesting Observations made by him, for the Purpose of ascertaining the Value of growing Timber Trees, at different and distant Periods of Time. For those Observations, the Society's GOLD MEDAL was given him in May 1808, and the Papers Printed in the 26th Volume of the Society's Transactions.*

SIR,

**I**N the Society's last volume, under the head of Agriculture, are some tables and observations of mine, on the growth of timber; and I have given one instance of six acres of very bad land, planted with Scotch firs under my directions, which at 29 years growth, and at the small price of 1s. a foot, had paid the owner 5*l.* per acre per annum compound interest. My motive in communicating these tables, observations and facts to the public, was to promote the planting of inferior and almost useless soils, in order to obtain from them timber of our own growth, sufficient for at least many of the purposes for which foreign timber is imported, at an immense annual expense. For instance, much of such inferior soils will be found on Cannock Heath in Staffordshire, on the moor lands in the north of that county, and on the moors in Derbyshire, Yorkshire, and northwards to Scotland, also on Bagshot Heath, Salisbury Plain, the heaths and wastes in Sursex, Hampshire, and Dorsetshire, and in many other counties in England, and also in Scotland and Wales. In that paper I suggested,

I suggested, that information of very great value on the subject of planting, might be obtained from Noblemen and Gentlemen, to whom the Society had given Medals and Premiums for planting trees, if they would communicate to the Society their subsequent observations on such plantations; but it is to be regretted that the Society have not yet received any communications on the subject.

I have been solicited to re-publish my tables, &c. by different gentlemen, who I have reason to believe are very competent to judge of them, and I have in consequence, several additional tables in forwardness with this view; but, previous to such publication, I wish to be furnished with a great variety of facts as to the growth of timber, and the management of plantations; and I shall feel much obliged to any persons, who will have the goodness, to send me their observations and statements of facts, respecting the growth and management of plantations; or, if they prefer it, they may send them to you at the Society of Arts, &c.; the names of those who send such statements will be either given or suppressed as may be requested.

I will recapitulate nearly in the words of my former communication, several particulars on which information is wanted. It would, for instance, be desirable to have the nature of the soil and under strata described, on which plantations have been made; its value per acre; the mode in which it was prepared for planting; the sorts of trees planted thereon, and which of them were found best suited thereto; the distances at which the trees were first planted; at what periods they were thinned, and how many cut out at each thinning; and their measure and value; the present height, distance, measure and value of the trees now growing on an acre; what distances are found most advantageous; also to what  
proportion

proportion of their heights they should be pruned up, and the best and most expeditious mode of performing the operation.

Great loss is frequently sustained by omitting to thin plantations properly, and in due time, but I am not in possession of facts to calculate with accuracy what this loss may be; I will however venture to give a short statement of some calculations I have made, as to the loss that would now be sustained, by letting trees grow to a great age.

In Miller's *Gardeners Dictionary*, it is stated that in a fall of oak timber in Lord Bagot's woods, Mr. Marshall counted the rings of one tree, which was sound at the butt, and found the number to be about 200. Its bole was 22 feet long, and 108 inches in circumference in the middle. Its contents 110 feet, which at 2s. amounts to 11*l*. I think it was last year, that a fine sound oak-tree was cut down, between Shrewsbury and Oswestry in Shropshire, of 300 years of age, and sold by auction for 52*l*. 5s.—And under my direction, many oak trees were cut down, some years ago, that could not be less than 300, and some of them probably 400 years of age, and even more. In Hunter's *Evelyn's Sylva*, is given the circumference of 10 trees, not one of which was probably less than 500, and some of them probably 1000 years old.

Lord Bagot's tree of 200 years old, above-mentioned, would, at the present price of 3s. a foot, be worth 16*l*. 10s. Supposing that 3s. a foot should continue to be the price of oak-timber, for the next 200 years, we will enquire what sum might be raised by growing four oak-trees in succession, upon the same spot of ground, each tree to be cut down when 50 years of age, and that their boles should be of the same length as that of Lord Bagot's, viz. 22 feet.

I fix on fifty years of age, as being convenient for my calculation;

calculation; and nearly the most profitable period at which to cut down trees of 22 feet bole, which have grown at the medium rate of one inch in circumference, and 12 inches in height, annually.

After its 52nd year, *such a bole* ceases increasing, after the rate of 5 per cent. per annum\*: but the whole tree, including the top part above the bole, may continue increasing after that rate until its 61st year†.

I do not fix on 50 years of age as being the most profitable age at which to cut down trees; probably 60 or 70 years of age would in some instances be preferable. Supposing an oak-tree has increased, as above-mentioned, its bole of 22 feet would, at 50 years of age, measure 39 inches in circumference at the middle, and one-fourth of this, namely  $9\frac{3}{4}$  inches, squared and multiplied into 22 feet, its length gives 14 feet 6 inches for its contents, which at 3s. a foot, its present value amounts to 2*l.* 3*s.* 6*d.* Supposing 2*l.* 3*s.* 6*d.* to be the value of each of the four trees of 50 years of age, grown in succession upon the same spot of ground, in the period of 200 years, we will calculate to what the three first trees would amount, if their value was placed out at compound interest, for the respective terms of 150, of 100, and of 50 years.

<i>£. s. d.</i>			<i>£. s. d.</i>		
2	3	6	Accumulating during 150 years, at 5		
			per cent. per annum compound interest,		
			will amount to	—	3,280 0 0
				Carry forward	3,280 0 0

\* See Table 12 of a bole of 24 feet, in the 26th volume of the Society's Transactions, page 63.

† See my first Table in ditto, page 49.

Brought



# AGRICULTURE.

83

<i>£. s. d.</i>		<i>£. s. d.</i>
	Brought forward	3,280 0 0
2 3 6	Accumulating as above for 100 years, would amount to	— 286 0 0
2 3 6	Accumulating as above for 50 years, would amount to	— 24 0 0
	Add the value of the tree to be cut down at the end of 200 years	2 3 6
	Total amount in 200 years	— 3,592 3 6

And carrying forward this calculation,  
the total amount of the produce in  
300 years, would amount to *£.* 472,408 0 0

In former times, when the value of oak-woods were estimated by the number of hogs their acorns would fatten, the great age of trees would be of small consideration; but in the present times, I am persuaded, that if gentlemen who have many trees standing of the age of 150 years and upwards, would give this subject its due consideration, they will be aware of the immense loss to which they are voluntarily subjecting themselves—And this great loss is much to be regretted, in a political point of view, especially as the produce of this island is insufficient for its necessary consumption.

My motives for troubling you with this hasty production are, to promote the good of the public, by endeavouring to persuade gentlemen to bring forward well ascertained facts, respecting the most profitable management of growing timber trees, and to induce them to investigate, with accuracy, this very curious and important subject. If you think it is likely to have those effects, I shall thank you to lay

lay this paper before the Society of Arts, &c. for their consideration.

I am, Sir,

Your obedient servant,

CHARLES WAISTELL.

*No. 99, High Holborn,  
Oct. 1869.*

To C. TAYLOR, M. D. SEC.

